

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) A non-volatile memory device ~~(30)~~ comprising:

an organic ambipolar semiconductor layer~~(19)~~; and

an organic ferroelectric layer~~(14)~~, said organic ambipolar semiconductor layer ~~(19)~~ and said organic ferroelectric layer ~~(14)~~ being at least partially in contact with each other.

2. (Currently amended) A ~~The~~ non-volatile memory device ~~(30)~~ according to claim 1, furthermore comprising a control electrode ~~(13)~~ being formed in a first conductive layer.

3. (Currently amended) A ~~The~~ non-volatile memory device ~~(30)~~ according to claim 2, the control electrode ~~(13)~~ being separated from said organic ambipolar semiconductor layer ~~(19)~~ by said organic ferroelectric layer~~(14)~~.

4. (Currently amended) A—The non-volatile memory device (30) according to claim 2, furthermore comprising a first main electrode (17)—and a second main electrode (18)—being formed in a second conductive layer, said first (17)—and said second (18)—main ~~electrode~~ electrodes being separated from each other by material of the organic ambipolar semiconductor layer—(19), and said first (17)—and said second (18)—main ~~electrode~~ electrodes being separated from said control electrode (13)—by said organic ferroelectric layer (14).

5. (Currently amended) A—The non-volatile memory device (30) according to claim 12, wherein the first conductive layer is a conductive polymer layer.

6. (Currently amended) A—The non-volatile memory device (30) according to claim 5, wherein the conductive polymer layer is a PEDOT/PSS layer or a PANI layer.

7. (Currently amended) A—The non-volatile memory device (30)

according to ~~any of claims 1~~ claim 4, wherein the second conductive layer is a conductive polymer layer.

8. (Currently amended) A—The non-volatile memory device ~~(30)~~ according to claim 7, wherein the conductive polymer layer is a PEDOT/PSS layer or a PANI layer.

9. (Currently amended) A—The non-volatile memory device ~~(30)~~ according to claim 1, wherein the organic ferroelectric layer ~~(14)~~ is a ferroelectric polymer or oligomer layer.

10. (Currently amended) A—The non-volatile memory device ~~(30)~~ according to claim 9, wherein the ferroelectric polymer or oligomer layer ~~(14)~~—is a layer comprising material selected from: $(\text{CH}_2\text{-CF}_2)_n$, $(\text{CHF-CF}_2)_n$, $(\text{CF}_2\text{-CF}_2)_n$ or combinations thereof to form (random) copolymers ~~like~~—including $(\text{CH}_2\text{-CF}_2)_n\text{-(CHF-CF}_2)_m$ or $(\text{CH}_2\text{-CF}_2)_n\text{-(CF}_2\text{-CF}_2)_m$.

11. (Currently amended) A—The non-volatile memory device ~~(30)~~ according to claim 1, wherein the organic ambipolar semiconductor

layer ~~(19)~~ comprises a mixture of an n-type and a p-type semiconductor material.

12. (Currently amended) A—The non-volatile memory device ~~(30)~~ according to ~~claim 11~~ claim 11, wherein the organic ambipolar semiconductor layer ~~(19)~~ comprises a mixture of [6,6]-phenyl C61 butyric acid methyl ester and poly[2-methoxy,5-(3,7) dimethyloctyloxy]-p-phenylene vinylene.

13. (Currently amended) A—The non-volatile memory device ~~(30)~~ according to claim 1, wherein the organic ambipolar semiconductor layer ~~(19)~~ comprises a single organic material.

14. (Currently amended) A—The non-volatile memory device ~~(30)~~ according to claim 13, wherein the single organic material is poly(3,9-di-tert-butylindeno[1,2-b] fluorene).

15. (Currently amended) A—The non-volatile memory device ~~(30)~~ according to claim 1, the memory device ~~(30)~~ comprising a memory window, whereby said memory window depends on ~~the~~ a ratio of

electron current and hole current.

16. (Currently amended) A ~~The~~ non-volatile memory device ~~(30)~~ according to claim ~~11~~15, whereby said ~~ratio~~ratio of electron current and hole current is close to 0 or close to 1.

17. (Currently amended) A method for processing a non-volatile memory device ~~(30)~~, the method comprising acts of:

forming an organic ferroelectric layer ~~(14)~~_i and

forming an organic ambipolar semiconductor layer ~~(19)~~, said organic ambipolar semiconductor layer ~~(19)~~—and said organic ferroelectric layer ~~(14)~~—being at least partially in contact with each other.

18. (New) A non-volatile memory device comprising:

first and second electrodes;

a control electrode;

an organic ambipolar semiconductor layer in contact with three sides of said first and second electrodes; and

an organic ferroelectric layer in contact with one side of

each said first and second electrodes, at least two sides of said control electrode and at least partially in contact with said organic ambipolar semiconductor layer.

19. (New) The device of claim 18, further comprising a planarization layer in contact with one side of said control electrode.